

REMARKS

Claims 52-62 are pending. Claims 20-51 have been canceled. No claims have been allowed. Applicant has submitted a Request for Continued Examination ("RCE") with the present Amendment.

Applicant has submitted an Abstract herewith, as requested by the Examiner.

Responsive to the Examiner's rejection of the pending claims under 35 U.S.C. §101, in that the disclosed invention is inoperative and lacks utility, Applicant submits the following response with reference to the specification of the present patent application.

The present invention is directed toward a safety vacuum cleaner, such as that shown in Fig. 1. In operation, rotation of turbine 5 induces an air flow at 6 through inlet channel 2 into housing 1, and thereafter through filter element 4. Many of the larger dust particles in the air flow fall to the bottom of housing 1 or are trapped within filter element 4. (*see* paragraph 46). However, some particles will pass through filter element 4, including both charged and uncharged particles. According to the present invention, turbine 5 is electrically grounded (*see* paragraphs 24 and 25). Due to the high rotational speed of turbine 5, the air flow in the immediate vicinity of turbine 5 changes direction several times, such that substantially all of the particles, regardless of whether they are charged or not, will hit the blades of the grounded turbine 5 several times. Neutral particles will not be charged upon contact with the grounded turbine 5, however, charged particles will be discharged upon contact with the grounded turbine 5.

As the particles pass through outlet channel 3 from turbine 5, the speed of the air flow is relatively low, such that the particles will be carried by the air flow through the outlet channel 3 without a substantial number of the particles hitting the walls of the outlet channel 3. Thus, when the particles contact the measuring electrode 11, substantially all of the particles will still be neutral. When the neutral particles contact electrode 11 and thereafter separate from electrode 11, a charge separation according to the triboelectric effect takes place, in which electrons from the neutral particles flow to the electrode 11 to generate a small, but measurable current (*see* paragraphs 13, 14, and 49). The positively charged particles then exit through the outlet of the safety vacuum cleaner.

The foregoing operation of the present invention is set forth in independent Claim 52, which reads as follows:

52. A safety vacuum cleaner including a measuring system for residual dust monitoring, comprising:

a housing including an air passage having an inlet, an outlet, and a flow cross section;

a turbine at least partially disposed within said air passage, said turbine rotatable to move an air stream through said air passage, the air stream containing dust particles, said turbine electrically grounded such that electrical charges associated with the particles are removed upon contact of the particles with said turbine;

a filter element disposed within said air passage; and

at least one electrode disposed within said air passage downstream of said turbine, said electrode shaped as a grid covering said flow cross section of said air passage, said electrode conducting an electrical current responsive to contact with uncharged particles and emitting a measurement signal indicative of the amount of the particles in the air stream.

The Examiner rejected prior Claims 20, 23-24, 28, 29, 33-36, 39, 41, 43-44, 46-49, as well as current Claims 52, 54, and 57-60 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 4,531,486 to Reif et al. (hereinafter "Reif et al. '486"). The Examiner rejected prior Claims 21, 22, 25-27, 30-32, 37-38, 40-42, 45, 50-51, as well as current Claims 53, 55-56 and 61-62 under 35 U.S.C. §103 as being obvious in view of Reif et al. '486. Applicant has canceled Claims 20-51.

Reif et al. '486 discloses an apparatus 10, shown in Fig. 1, for measuring the concentration of particles in a gas. Apparatus 10 includes cylindrical conduit 14 through which air flows from air filter 16 to a gas receiving device, such as engine 18. Electrode 20 is disposed within conduit 14, and may take any of the forms shown in Figs. 2-5. Apparatus 10 "depends for its operation upon the flow of charged particles along the conduit [14]". (col. 6, lines 3-4). Specifically, the flow of air containing charged particles through conduit 14 and around electrode 20 induces a charge on electrode 20 which can be

measured by a sensitive electrometer. In this manner, electrode 20 of apparatus 10 only detects the flow of *charged* particles through conduit 14. If apparatus 10 is used in environments in which the particles in the air stream flowing along conduit 14 are not naturally charged to a degree sufficient to ensure proper operation of apparatus 10, apparatus 10 may optionally include ionizer assembly 40 to charge the particles, shown in broken lines in Fig. 1. (*see col. 8, lines 3-9*).

Applicant respectfully submits that independent Claim 52 is not anticipated by Reif et al. '486 because Reif et al. '486 fails to disclose each and every element of independent Claim 52. Specifically, Reif et al. '486 fails to disclose a safety vacuum cleaner including a housing with an air passage, a turbine at least partially disposed within the air passage, and at least one electrode disposed within the air passage downstream of the turbine, as called for in independent Claim 52. Referring to Fig. 1 of the present patent application, it may be seen that electrode 11 is disposed within air passage 3 downstream of turbine 5. By contrast, the apparatus 10 shown in Fig. 1 of Reif et al. '486 completely lacks a turbine, much less a turbine which is disposed upstream of electrode 20.

As discussed above, it is important in the operation of the safety vacuum cleaner of the present invention that the turbine 5 is disposed upstream of the electrode. Specifically, contact of charged particles with the blades of turbine 5 as the particles flow around turbine 5 discharges the particles, because turbine 5 is electrically grounded. Thereafter, upon leaving turbine 5 and passing through air passage 3, the particles will be neutral and will generate a current in electrode 11 upon contact via the triboelectric effect.

In view of the foregoing, Applicant respectfully submits that independent Claim 52 is not anticipated by, nor obvious in view of, Reif et al. '486. Further, because Claims 53-62 each dependent from independent Claim 52, Applicant further submits that Claims 53-62 are also not anticipated by, nor obvious in view of, Reif et al. '486.

It is believed that the above represents a complete response to the Official Action and reconsideration is requested. Specifically, Applicant respectfully submits that the application is in condition for allowance and respectfully requests allowance thereof.

In the event Applicant has overlooked the need for an additional extension of time, payment of fee, or additional payment of fee, Applicant hereby petitions therefore and authorizes that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

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Should the Examiner have any further questions regarding any of the foregoing, he is respectfully invited to telephone the undersigned at (260) 424-8000.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: February 24, 2004

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Name of Registered Representative



Signature

February 24, 2004

Date